## REMARKS

Claims 1-12 are all the claims pending in the application. Claim 1 and the specification have been amended. Support for the claim and specification amendments can be found throughout the specification and originally filed claims.

Specifically, support for the claim 1 amendment can be found at least at page 10, line 2, page 14, lines 4 and 9-21, page 18, line 10-page 18, line 4, and in Figures 6-8.

Abstract has been amended to shorten its length.

Accordingly, no new matter has been introduced by these amendments.

**Preliminary Matters**

Applicant thanks the Examiner for acknowledging the claim for foreign priority and confirming receipt of the certified copy of the priority document.

In the Office Action Summary, however, it appears that the Examiner inadvertently did not mark an acceptance of the drawings filed on January 25, 2006. Applicant respectfully requests that the Examiner indicate acceptance of the drawings in the next action.

**Present Claims Comply With 35 U.S.C. § 112**

Claims 1-12 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Specifically, the Examiner asserts that the recited limitations of "outer edge part" and "active material region" in the present claims are not clearly defined in the specification, which renders claim indefiniteness.

In response, Applicant has amended claim 1 to replace the phrase "led out to the outer edge part" with "exposed from the laminate case." Support for this claim amendment can be found at least at page 18, line 10-page 18, line 4 and in Figures 6-8.

Moreover, regarding the limitation of "active material region," Applicant directs the Examiner's attention to items 1 and 2 of Figures 1 and item 11 of Figures 2, 4 and 5, all of which clearly define an "active material region" in the claimed lithium ion secondary battery.

Accordingly, Applicant respectfully submits that all the limitations of present claims are sufficiently defined in the specification and request that this rejection under 35 U.S.C. § 112 be reconsidered and withdrawn.

**Present Claims Define Allowable Subject Matter**

Claims 1-12 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tanjou *et al.* (U.S. Patent Application No. 2003/0215702; "Tanjou") in view of Takeuchi *et al.* (U.S. Patent No. 6,083,645; "Takeuchi '645"), Takeuchi *et al.* (JP 2003-208895; "Takeuchi '895") and Shimamura *et al.* (U.S. Patent Application No. 2003/0113621; "Shimamura").

First, Applicant respectfully submits that there is no reason for one of ordinary skill in the art to combine the teachings of the cited reference. As the Supreme Court recently stated, the "apparent reason to combine the known elements in a fashion claimed by the [claims] at issue ... should be made explicit." *KSR Int'l Co. v. Teleflex, Inc.* No 04-1350 slip op. at 14 (U.S. Apr. 30, 2007).

Specifically, Tanjou teaches a sheet-type lithium ion secondary cell comprising a sheet-type positive electrode 5a, which is formed by laminating positive electrode active material on both sides of the positive electrode current collector made of aluminum, and negative electrode 5b, which is formed by laminating negative electrode active material on both sides of the negative electrode current collector made of copper, being laminated alternately through separator 5c. *See* Paragraph [0090]. However, there is no discussion or suggestion of the relations of thicknesses between the positive electrode current collector and the positive electrode active material layer or between the negative electrode current collector and the negative electrode active material layer.

Shimamura discloses a secondary battery comprising a positive electrode 4 composed by using aluminum foil having a thickness of approximately 20 μm as the positive electrode collector 5 and by coating $LiMn_2O_4$ as a positive electrode active material on the aluminum foil, and a negative electrode 6 composed by using copper foil having a thickness of approximately 10 μm as the negative electrode collector 7 and by coating hard carbon that is amorphous carbon as a negative electrode active material on the copper foil, separator 8 and a laminate film 3. *See* Paragraph [0052]. However, Shimamura only discloses the thicknesses of metal foil for current collector or metal plate for terminal electrode, but does not clearly disclose the thickness of the positive and negative active material layers at all.

However, Takeuchi '645 discloses a cylindrical battery in which the average particle size of the cabon particles, which are used as a negative electrode active material, is not greater than 50 μm (see, col. 5, lines 18-19); the thickness of the compound layer, which is corresponding to a negative electrode active material layer, is preferably 10 to 200 μm (see, col. 5, lines 60-61); an

active substance used for the positive electrode may be a compound oxide such as $LiCo0_2$, $LiNiO_2$ or $LiMn_20_4$ (see, col. 5, lines 65-67). Further, there is no concrete value of the active layer thickness in Example.

Takeuchi '895 also discloses a cylindrical secondary battery composed of a positive electrode which is formed by coating a lithiurn nickel complex oxide having 1 μm or more (l μm or 3 μm in Examples) of primary particle diameter on both side of 20 μm-thick aluminum foil current collector by 40 μm-thick per one side, a negative electrode which is formed by coating a past containing a spherical artificial graphite on both side of 10 μm-thick copper foil current collector by 30 μm-thick per one side, and cylindrical shape cell case. *See* Paragraph [0027]. However, the actual diameter of the positive electrode active material means a secondary particle diameter and the secondary particle diameter is in the range of 12 to 28 μm in it Examples. Further, there is no disclosure or suggestion to the film thickness of neither positive electrode nor negative electrode.

For the reasons set forth above, while both Takeuchi '645 and '895 relate to a cylindrical battery, it is unobvious that the teachings of these references can be applied to a laminate type battery taught by Tanjou. Furthermore, Takeuchi '645 only teaches a average particle size of the negative active material, while Takeuchi '895 only teaches a primary particle diameter of the positive active material. Thus, Applicant respectfully submits that one of ordinary skill in the art would have no reason to modify a laminate type battery in Tanjou to have the parameters of a cylindrical battery in Takeuchi '645 and '895 in order to reach the presently claimed invention.

Second, Applicant submits that the claimed invention is not obvious over the combination of the cited reference because the presently claimed invention possesses

unexpectedly superior properties, such as a high density of 3000 W/kg or more with a light weight and an excellent cooling property. As MPEP § 716.02(a) states, "[e]vidence of unobvious or unexpected advantageous properties, such as superiority in a property the claimed compound shares with the prior art, can rebut *prima facie* obviousness. 'Evidence that a compound is unexpectedly superior in one of a spectrum of common properties . . . can be enough to rebut a *prima facie* case of obviousness.' ... *In re Chupp*, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987) ... [p]resence of a property not possessed by the prior art is evidence of nonobviousness. *In re Papesch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963)."

Specifically, as shown in the comparison of Example with Comparative Example 1 in the present specification, the capacity at large current is improved and the dischargeable time is elongated when the thickness of an electrode is thinned as claimed. Moreover, the temperature rise on the surface of a battery is also improved when the thickness of the electrode is thinned as claimed. Furthermore, as shown in the comparison of Example with Comparative Example 2, even in the same thickness, the temperature rise on the surface of a battery of the laminate type, as presently claimed, is smaller. In addition, as shown in the comparison of Example with Comparative Example 3, the temperature rise on the surface of a battery is large, and a battery having a high output cannot be obtained when the width of a terminal is narrower than the claimed width.

The present specification clearly discloses that parameters, such as the thickness of the active material layer and particle size of the active material, use of laminate casing and use of liquid electrolyte, have been studied prior to the time of the present invention. However, these

parameters are only individually studied, and not in their totality for a large size and high power battery.

For example, as stated above, Takeuchi '645 only teaches the average particle size of the negative active material, while Takeuchi '895 only teaches the primary particle diameter of the positive active material. Furthermore, JP H07-282,841A and JP H08-96,841A, which are cited in Tanjou, disclose a laminate-type lithium ion battery having high power output and large size. In JP H07-282,841A, which corresponds to U.S. 5,871,861, the active material layer thicknesses are 250 μm on each side. Since the active material layers are formed on both sides of a current collector, the thicknesses of both electrodes excluding the current collector are 500 μm. In JP H08-96,841A, the thickness of negative electrode excluding the current collector is 300 μm (150 um on each side) and the thickness of positive electrode excluding the current collector is 290 um (145 μm on each side).

On the other hand, in the present invention, the inventor has examined various parameters in totality to obtain a large size and high power battery and as a result, he has firstly achieved a lithium ion secondary battery with unexpectedly superior power density of 3000 W/kg or more with a light weight, and being excellent in cooling property.

Additionally, with respect to the cooling property, while both Tanjou and Simamura focus only on heat dissipation means at the outside of the battery, the present invention focuses on the heat generation in the inside of the battery.

For the reasons set forth above, Applicant submits i) that one or ordinary skill in the art would not have a motivation to combine the cited references and ii) that the presently claimed invention possess unexpectedly superior properties.

Accordingly, Applicant respectfully requests that this rejection under 35 U.S.C. § 103 be reconsidered and withdrawn.

**Double Patenting Rejection**

Claim 1-12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claim 1-10 of copending Application No. 10/352,134 in view of Takeuchi (U.S. Patent No. 6,083,645) and Shimamura (U.S. Patent Application No. 2003/0113621).

Applicant respectfully notes that the Office incorrectly sets forth a provisional double patenting rejection. U.S. Patent Application No. 10/352,134 has been issued as U.S. Patent No. 7,029,789 on April 18, 2006, and is no longer pending. Thus, the double patenting rejection is no longer provisional.

In response, Applicant encloses hereinwith an executed Terminal Disclaimer.

Accordingly, withdrawal of the above double patenting rejection is respectfully requested.

**Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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